REMARKS

The present application was filed on February 10, 2004 with claims 1 through 22. Claims 1 through 22 are presently pending in the above-identified patent application. Claims 6 and 12 are proposed to be amended herein

In the Office Action, the Examiner rejected claims 6 and 12 under 35 U.S.C. §112, first paragraph, as failing to comply with the enablement requirement. In addition, the Examiner rejected claims 6 and 12 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter that applicant regards as the invention.

Claims 1-5 and 13-17 were rejected under 35 U.S.C. §103(a) as being unpatentable over Madsen ("Optical All-Pass Filters for Polarization Mode Dispersion Compensation"), in view of Bessios (United States Number 7,110,683). In addition, claims 7-11 and 18-22 were rejected under 35 U.S.C. §103(a) as being unpatentable over Madsen in view of Wang et al. (United States Publication Number 2005/0008070 A1)

Section 112 Rejections

In the Office Action, the Examiner rejected claims 6 and 12 under 35 U.S.C. §112, first paragraph, as failing to comply with the enablement requirement. In addition, the Examiner rejected claims 6 and 12 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter that applicant regards as the invention

Claims 6 and 12 have been amended in accordance with the Examiner's suggestion to comply with the Examiner's concerns under 35 U.S.C. §112, second paragraph. In particular, Claims 6 and 12 now expressly define the variables a, b, P, Q, T and n. Applicants submit that the original specification already complies with 35 U.S.C. §112, first paragraph, to fully define these variables and to enable a person of ordinary skill in the art to make and use the inventions defined by claims 6 and 12. In addition, the original specification fully supports the present amendments to claims 6 and 12. For example, as shown in the exemplary embodiment of FIG. 6, there are two all-pass filters A and B. The all-pass filters A and B have coefficients a and b, respectively, where a and b are vectors, in accordance with conventional notation and defined by equation (20) (page 9, lines 17-20).

The term "T" indicates a transpose operation on the vector, in accordance with conventional notation, since the vector is a column vector, and when written out in a textual form in one row it needs to be shown as a transpose operation. P indicates the number of coefficients (dimension) in the vector a and Q indicates the number coefficients (dimension) in the vector b (see, page 9, line 19). The variable "n" is the iteration number in the LMS (claim 6) or Newton (claim 12) algorithm

recursion, where the algorithm goes from iteration n to iteration n+1 (see, e.g., equation (21))

Applicant respectfully requests withdrawal of the section 112 rejections

Independent Claims 1, 7, 13 and 18

Independent claims 1 and 13 were rejected under 35 U.S.C. §103(a) as being unpatentable over Madsen in view of Bessios. With regards to claims 1 and 13, the Examiner asserts that Madsen discloses a method for compensating for polarization mode dispersion in an optical fiber communication system (citing Abstract), comprising the steps of: reducing said polarization mode dispersion using a cascade of all-pass filters (citing Fig. 1); and adjusting coefficients of said all-pass filters (citing 3rd full par. Of col. 1 on page 879).

The Examiner acknowledges, however, that Madsen does not expressly disclose that the coefficients are adjusted using a least mean square (LMS) algorithm. The Examiner asserts, however, that adaptive FIR filters, such as those in Madsen, require an algorithm to determine proper coefficients, and that it is well known in the art to use the least mean square algorithm in adaptive FIR filters for optimizing coefficients (citing Bessios).

Applicant acknowledges that the use of the LMS algorithm for adapting FIR filters is both well-known and straightforward. Applicant strongly asserts, however, that it would not have been obvious to a person of ordinary skill in the art to apply the LMS algorithm to the adaptation of all-pass filters. It is not known to adapt all-pass filters using the LMS algorithm. Furthermore, the adaptation equations for FIR filters do not apply to the adaptation of an all-pass filter.

In further support of Applicant's position that it would not have been obvious to a person of ordinary skill in the art to apply the LMS algorithm to the adaptation of all-pass filters, Applicant notes that for most applications, an all-pass filter is not advantageous and an FIR filter is much easier to implement. Thus, persons of ordinary skill in the art are inclined to use FIR filters and due to the complexity of an implementation with an all-pass filter, would not be motivated to substitute an all-pass filter for an FIR filter, in the manner suggested by the Examiner. In addition, since the adaptation equations for FIR filters do not apply to the adaptation of an all-pass filter, the combination suggested by the Examiner would not work.

Independent claims 7 and 18 were rejected under 35 U.S.C. §103(a) as being unpatentable over Madsen in view of Wang et al. With regards to claims 7 and 18, the Examiner again asserts that Madsen discloses a method for compensating for polarization mode dispersion in an optical fiber communication system (citing Abstract), comprising the steps of: reducing said polarization mode dispersion using a cascade of all-pass filters (citing Fig. 1); and adjusting coefficients of said all-pass

filters (citing 3rd full par. of col. 1 on page 879).

The Examiner acknowledges, however, that Madsen does not expressly disclose that the coefficients are adjusted using a Newton algorithm. The Examiner asserts, however, that adaptive FIR filters, such as those in Madsen, require an algorithm to determine proper coefficients, and that it is well known in the art to use the Newton algorithm in adaptive FIR filters for optimizing coefficients (citing Wang et al).

Applicant acknowledges that the use of the Newton algorithm for adapting FIR filters is both well-known and straightforward. Applicant strongly asserts, however, that it would not have been obvious to a person of ordinary skill in the art to apply the Newton algorithm to the adaptation of all-pass filters. It is not known to adapt all-pass filters using the Newton algorithm. Furthermore, the adaptation equations for FIR filters do not apply to the adaptation of an all-pass filter.

In further support of Applicant's position that it would not have been obvious to a person of ordinary skill in the art to apply the Newton algorithm to the adaptation of all-pass filters, Applicant notes that for most applications, an all-pass filter is not advantageous and an FIR filter is much easier to implement. Thus, persons of ordinary skill in the art are inclined to use FIR filters and due to the complexity of an implementation with an all-pass filter, would not be motivated to substitute an all-pass filter for an FIR filter, in the manner suggested by the Examiner. In addition, since the adaptation equations for FIR filters do not apply to the adaptation of an all-pass filter, the combination suggested by the Examiner would not work.

Applicants respectfully request the withdrawal of the rejection of independent claims 1, 7, 13 and 18.

Dependent Claims

Claims 2-6, 8-12, 14-17 and 19-22 are dependent on independent claims 1, 7, 13 and 18, and are therefore patentably distinguished over Madse, Bessios and Wang et al., alone or in any combination, because of their dependency from independent claims 1, 7, 13 and 18 for the reasons set forth above, as well as other elements these claims add in combination to their base claim.

All of the pending claims following entry of the amendments, i.e., claims 1-22, are in condition for allowance and such favorable action is earnestly solicited.

If any outstanding issues remain, or if the Examiner has any further suggestions for expediting allowance of this application, the Examiner is invited to contact the undersigned at the telephone number indicated below.

The Examiner's attention to this matter is appreciated

Respectfully submitted,

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